

U.S. Environmental Protection Agency
Science Advisory Board
Final Minutes of Public Meeting
September 22, 2005

Committee: SAB Workgroup on Coastal Mississippi Water Quality Assurance Plan.
(See attached Roster)

Date and Time: September 22 from 1-3 Eastern Time (See attached Federal Register Notice)

Location: By telephone only

Purpose: The purpose of this meeting was to allow the SAB workgroup members to discuss the Agency's "*Water Quality Study of Bays in Coastal Mississippi, Quality Assurance Project Plan (QAPP)*," prepared by U.S. Environmental Protection Agency Region 4. (These materials are posted at the SAB's website, www.epa.gov/sab and will be included in the FACA file for this meeting

Materials Available: The following materials were distributed before the meeting:

1. EPA's *Water Quality Study of Bays in Coastal Mississippi, Quality Assurance Project Plan.*, prepared by U.S. Environmental Protection Agency Region 4
2. agenda
3. roster and biosketches
4. Collected individual comments
5. Summary of Workgroup comments

Attendees: Because this was a conference call, there are no sign-in sheets.

The following individuals from the Workgroup were present for most or all of the call: Dr. Philip Singer, Dr. Jeffery Griffiths, Dr. Randy Maddalena, Dr. Gary Sayler, and Dr. Michael McFarland

The following individuals from the SAB Staff Office were present for part or all of the call: Dr. Anthony Maciorowski, Associate Director for Science and Dr. Sue Shallal, Designated Federal Official

The following individuals from EPA were present for part or all of the call:

1. Mike Peyton
2. Charles Hooper
3. Bill Bokey
4. Bill Cosgrove

There were other individuals who had requested the conference call number, indicating that they planned to attend.

The following is a chronological summary of the meeting.

The meeting went largely according to the agenda (attached)

1. Welcome, Roll Call, and Opening Remarks DFO Sue Shallal (1:03)

Dr. Sue Shallal, the Designated Federal Officer welcomed those present. She explained that the Science Advisory Board, which operates under the Federal Advisory Committee Act, would normally have announced this meeting through a Federal Register Notice at least 15 days in advance. Since this activity is related to the devastation caused by Hurricane Katrina and we are working expeditiously to respond to the Agency's need to quickly address the resultant environmental impacts, we are announcing these series of public meetings by posting this information on the SAB website.

Materials relating to this activity are posted on the SAB's website (www.epa.gov/sab). These include the roster, biosketches, the charge and documents provided by EPA, and the agenda. Other materials will be posted there as they become available, including the minutes of this call. The minutes will be used to document the findings and recommendations of the Workgroup.

Dr. Shallal then determined which workgroup members were on line and allowed other participants to identify themselves.

2. Presentation by EPA representatives

Mike Peyton

Bill Cosgrove

Mike Peyton gave a short overview of the purpose of this review and how the SAB advice would be incorporated into the Agency's plan. He began by stating that the Agency is interested in the SAB's input in order to ensure that the best science is being used to assess the environmental impacts of Hurricane Katrina. We want to be able to withstand any scrutiny that may occur after the assessments and clean-up efforts are complete.

He continued noting that this is meant to be a very terse evaluation of the current conditions. If any unusually high levels of contaminants are found, further testing would be initiated. This type of sampling and testing is routine for the Region 4 Science and Ecological Support Division. The main focus will be to look at the ecological impacts rather than human health; however, if high levels of contaminants are found, a more thorough investigation of the human health impact will also take place.

One of the charge questions asks, is the design going to provide adequate data to meet the objectives? We will collect new data and see if historic data is comparable. Sediment and water sampling in neighborhoods will also occur shortly under a new plan which will also be brought to the SAB.

Bill Cosgrove

Bill Cosgrove then added that the QAPP has been reviewed and accepted by EPA's Office of Research and Development Gulf Breeze Labs, Mississippi DEQ, and Region 4 scientists.

Mississippi DEQ had made the request to the EPA for aid in getting preliminary estimates of loading of contaminants in their coastal water bodies. A Mississippi Sound study is upcoming and this information will be helpful to them.

Phil Singer

Dr. Singer, committee chair, began by stating how much we all appreciate the work that is being carried out by EPA personnel on the ground in the Gulf area, and understood the pressure that they were working under, especially with Hurricane Rita now looming in the background.

He continued noting that workgroup members have provided their comments in an expedited manner. He has tried to summarize the group's findings; however, at this time, not everyone's comments have been included in the summary.

A. Discussion by Charge Question

Charge Question 1. Are the project objectives clearly stated?

He then began the discussion of responses to the charge questions. Charge question #1 states, "Are the project objectives clearly stated?" Yes, the study will provide an opportunity to get a "snap shot" of what is getting into Mississippi water bodies. He asked if other workgroup members had other comments. He noted that Dr. Griffiths had asked what the next steps would be after the study is complete

Jeff Griffiths

Dr. Griffiths added that the language of the QAPP appears to indicate that this plan is intended to get "a quick look". A concern may be that this is the only look being taken.

Bill Cosgrove

Bill Cosgrove responded that some qualifiers were added to the QAPP that were not in the version that SAB received. They make clear that this plan is not intended to identify

specific pollutants sources in each of the systems, or to identify potential long-term effects on water quality as a result of Hurricane Katrina.

He added that the study was designed with input from MS-DEQ to respond to some of their concerns. For example, Bay St Louis was included due to concerns about the oyster beds in the Bay and Bayou Casotte has a phosphate plant and a refinery in its vicinity and is also where there are lots of historical data. If a significantly increased level of contaminants is found, a more targeted study can be designed to assess the impacts.

MS-DEQ staff will also be participating in this study with EPA personnel. He gave other examples of areas that were identified due to the industries surrounding them, i.e. wastewater facilities or other considerations that made them potential areas of concern.

Dr. Singer indicated that it is helpful to know what the QAPP is not intended to do.

Michael McFarland

Dr. McFarland asked if this study will be used to support decisions regarding imminent risk.

Bill Cosgrove

No, this study is not meant to estimate human health impacts, drinking water exposure or long-term ecological damage. We are trying hard not to elevate expectations as to what the uses for this data will be. The study will only provide preliminary data to help in designing more targeted studies. We were interested in the previous SAB comments from Dr. Gilbert and Dr. Maney and tried hard to clarify the limited use of the data.

Dr Singer asked if there are other comments regarding charge #1. Hearing none, he moved on to charge question #2.

Charge Question 2. Sampling Design- will it provide the data needed to meet the stated objectives

Dr. Singer began the discussion by listing some of the themes that he found in reading through the comments of the workgroup members. Workgroup members have voiced concerns regarding the following issues:

1. Replicates
 - sample collection
 - analytical reliability
2. Representativeness of the data
3. Rationale of location selection
4. Restricting the study to chemicals, with no microbial testing

5. No Ecotox testing

Dr. Singer started the discussion by noting that he appreciates that there are limited resources and that time is an issue. When making recommendations we have tried to keep in mind what is feasible under these circumstances.

The first concern is with regards to the water column testing. Is a single transect at a single point in time going to give you reliable information regarding contaminant levels and how much uncertainty there is in the levels ultimately reported?

Bill Cosgrove

Bill Cosgrove responded by stating that the question of heterogeneity is something we are aware of. We hope that we have been clear that this is a preliminary estimate. This is only a snap shot. We do not intend to use the data as inputs for a model or as any precise measurements. The limitation of resources prevents us from doing more testing.

Dr. Singer offered a recommendation. If all of the water bodies cannot be sampled twice, you may be able to sample at least one of the bays twice. This can give you some indication of the uncertainty you are dealing with.

Randy Maddalena

Dr. Maddalena asked about whether the historical data can be used to determine the heterogeneity of the measurements in the system before the hurricane struck.

Bill Cosgrove

Bill Cosgrove responded that he was unsure of how useful the historical data would be in determining heterogeneity. He continued by stating that there are different types of data for the different locations. The correlation between new data and historical data is probably very limited. If there is time available, a second look at one of the Bays is a good idea.

Dr. Singer continued with the second concern regarding analytical duplication. He stated that there are a small number of duplicates, only 3 of 29; is this enough? Can you take one of the bays and do the analyses on duplicate samples? The extent of variability needs to be assessed. Making comparisons to historical data and comparing among duplicate analyses will be useful.

Dr. Singer also noted that there is only a single sediment sample being retrieved using the dredging equipment. Can more than one sample be taken? (i.e., 2 samples, composite the 2 samples and analyze).

Randy Maddalena

Dr. Maddalena asked about the current conditions; is the water murky or clear?

Bill Cosgrove responded that the water is relatively clear. Sampling of the water will occur. If the water is uncontaminated, then the sediment will be tested to see if there is settling of the contaminants occurring.

Dr. Singer then introduced the concerns about the issue of representativeness. He reiterated that, to the extent that resources allow, duplication is desirable.

Dr. Singer continued seeking clarification regarding the timing of the sampling. He understood that it was to occur at mid-ebb tide when the water is going out of the bays and into the Sound. No samples are being taken when the water is going back into the bays.

Bill Cosgrove responded that this is correct and that they were looking at maximum loading of contaminants.

Dr. Singer added that this would not allow them to examine the net loading of contaminants into the Sound..

Jeff Griffiths

Dr. Griffiths suggested that the frequency of follow-up is unclear in the QAPP. The text should be revised to indicate that this is a “snap shot”.

Dr. Singer added that the selection criteria for the historical location should be included in the QAPP. He then addressed the last concern regarding the testing of microbes.

Bill Cosgrove

Bill Cosgrove indicated that MS-DEQ was originally to work with USGS to do testing on microbes; however, the plan has been revised to include enterococcus testing.

Dr. Griffiths agreed that enterococcus will be the best indicator of fecal contamination.

Dr. Singer indicated that Ecotox testing should also be considered.

B. Wrap-up and Next Steps

Workgroup members were asked to add any comments that have not yet been included in the summary. Dr. Singer will then revise the summary and provide the final version to the DFO (Appendix A).

The DFO will draft the minutes and provide them to Dr. Singer to edit and certify. They anticipate that the minutes will be completed by COB September 23. The minutes will be posted at the SAB's website by early next week.

After thanking the participants for their efforts, Dr. Singer adjourned the meeting at about 2:18 p.m.

Respectfully Submitted: Certified as True:

/Signed/

Dr. Suhair Shallal
Designated Federal Official

/Signed/

Dr. Philip Singer
Chair SAB Workgroup on Residue Sampling Plan

APPENDIX A

Water Quality Study of Bays in Coastal Mississippi Quality Assurance Study Plan Project #05-0926

Background

The US-EPA Region 4 Science & Ecosystem Support Division (SESD) Ecological Assessment Branch (EAB) has been requested by the Region 4 Deputy Regional Administrator (DRA) to have the “Water Quality Study of Bays in Coastal Mississippi” Quality Assurance Study Plan (QAPP) peer reviewed by appropriate members of EPA’s Science Advisory Board (SAB).

This water quality study is being conducted at the request of, and with participation of the Mississippi Department of Environmental Quality. EAB is believed to have a considerable degree of experience in the water bodies that are included in the study. The branch has conducted numerous comprehensive water quality studies in each of the rivers and bays along the Mississippi coast during the past two decades, with the MDEQ participating in most of those studies. The sampling/sample handling procedures and analytical methods used by SESD are outlined in Branch Quality Assurance Manuals and Standard Operating Procedures that are referenced in the document. These procedures have not only been used for many scientific data collection activities, but have also served as the basis for sample collection methods in highly scrutinized civil and criminal proceedings.

The QAPP being submitted for review is believed to provide sufficient detail to meet quality assurance requirements, and is believed to contain the information needed for the planning, implementation and assessment phases of the study.

Charge to the SAB

In accordance with the agency’s Peer Review Policy, EAB is requesting SAB technical input on the following areas in the QAPP:

1. Project objectives – are they clearly stated?
2. Sampling design – will it provide the data needed to meet the stated objectives?

Response to Charge 1

The primary objective of this study, i.e. to provide water quality and flow data in each major bay system feeding Mississippi Sound to provide an estimate of both conventional and toxic pollutant loadings entering the Sound is clearly stated. The intent of this study is to conduct water and sediment sampling along with in situ measurements to determine water quality parameters and provide a one-time snapshot of pollutant loading of the major bay systems of the Mississippi Sound following the damage and disturbance caused by Hurricane Katrina.

The idea of expanding the study to include the historic sampling stations employed by the Mississippi Department of Environmental Quality to provide some relative comparison of current conditions to the historical record is also a good one. Sampling locations were selected in coincidence with established sampling location in order to put the resulting data into a comparative historical context. Application of the EPA data quality objectives (DQO) process (Appendix A) was appropriate but as there was no decision rule identified (step 5), the quantitative steps of the DQO process (steps 6 and 7) could not be fully addressed. It is anticipated that this situation will change once decision-makers articulate the risk assessment/management decision that require resolution.

These are reasonable objectives and if met should provide useful information. These results would also be used in guiding future assessments. Perhaps there should be additional discussion of how these findings will inform future monitoring efforts in this region and how these findings may be linked to geospatial/temporal data for Mississippi Sound ecosystem indicator organisms. The Agency may wish to include a sentence stating that the frequency and timing of future monitoring efforts are yet to be determined, and to reinforce that the objective for this specific monitoring is to provide initial, preliminary data.

This data collection activity does not seem to be intended to be used legally or for enforcement purposes but rather is closer to a damage assessment/longer term ecosystem monitoring exercise. The report should clearly state that the results of the sampling activity will not be extrapolated to answer questions regarding public health or environmental risks posed by contaminated water and/or sediment. Does this perhaps need to be stated at the outset?

Response to Charge 2

Scientists from EPA's Science and Ecosystem Support Division, with the assistance of their colleagues in the Mississippi Department of Environmental Quality, have put together a reasonable plan for this study, given the short time available to them and, undoubtedly, the limited resources available. The study will be somewhat limited, however, because temporal and spatial variation in water quality parameters will not be systematically analyzed.

It is not clear that the proposed study design will meet the stated objectives. The research team plans to collect and analyze water and sediment samples from the four major bay areas feeding the Mississippi Sound using rigorous quality-assured methods to minimize

sampling and analytical error. A major concern of the program, however, is the reliance of the findings on a one-time grab sample with minimal use of replicates. There are questions about the usefulness of these current data for statistical comparative analysis if a future assessment campaign is conducted

1. Samples for water quality analysis will be collected at quarter points along each channel cross section and composited to provide a single representative concentration for each analyte. The samples will be collected during mid-ebb tide to assess the loading to the Sound from the bays. The question becomes one of representativeness of that composited grab sample. We know that resources are limited and time is an issue, but there needs to be some validation that the values reported are indeed representative of the average outflow concentrations so that loadings can be calculated with some degree of confidence. It would be desirable to collect samples across each channel section on two separate mid-ebb time periods to ascertain the variability in measured concentrations and resultant pollutant loadings to the Sound. At a minimum, a second set of samples should be collected across at least one of the channels, the one expected to produce the greatest loading.
2. Sediment analysis will be performed on one grab sample taken at each identified location. Again, the representativeness of a single grab sample is questionable. It would be desirable to take a minimum of two samples at each site with the Petite Ponar dredge (i.e. drop the dredge a few times) and then combine the samples prior to homogenization.
3. There are an insufficient number of duplicate samples to be analyzed. Table 1 shows that water quality analysis is to be performed in duplicate for only three water samples out of 29. No duplicates are indicated for the sediment samples in Table 2. Is there a mis-print in Table 2? Should BBBD3 carry an asterisk? Even if that is the case, one duplicate sample out of 14 is not sufficient to characterize uncertainty in the final reported values.
4. Table 2 indicates that: one set of composited samples will be analyzed for TOC, nutrients, and metals; 3 sets of composited samples will be analyzed for volatiles; and 2 sets of samples will be analyzed for semi-volatiles.
 - i. How will the volatile samples taken at each quarter point along the channel be composited, given their volatile nature?
 - ii. Will the volatile contaminants be analyzed in triplicate and the values averaged, or will the three samples at each quarter point along the channel be composited first and then analyzed?
 - iii. Same question for the semi-volatiles. Will the two samples be analyzed separately, or will they be composited first and then analyzed?
 - iv. Again, why are there no duplicates for TOC, nutrients, and metals?

5. Samples are to be measured only once, at mid-ebb tide, to capture the outflow of contaminants into the Mississippi Sound. But on the incoming tide, many of these contaminants will flow back into the bays, so the NET outflow from the bays to the Sound will not be determined from this sampling program. Consideration, if time and resources permit, should be given to sampling on the next incoming tide so that the NET flux of contaminants into the Sound can be calculated.
6. Suspended material can significantly influence the fate and concentrations of the less soluble organic contaminants. Is there any plan to measure/report the concentration and organic content of the suspended fraction? For the water quality parameters to be measured, it is assumed that these are “total” concentrations, including particulate material. Is there anything to be learned by also measuring dissolved concentrations of these contaminants?
7. Capitalizing on the opportunity to take samples at the historical MDEQ locations is a good idea. It would be useful to know more about these historical locations to get a better idea of the connectivity of this new study with the historical data.
 - i. What parameters are typically measured at these historical locations, and how frequently are they measured?
 - ii. How and why were these specific sampling stations chosen and designation of these historical sampling sites in Table 1 would be useful
 - iii. Do any of the sampling stations represent the absolute end members of the “greater estuary”? Do they adequately capture riverine sources/inputs?
 - iv. The sampling program for the “historical” record is not described. A description is only provided for the channel cross sections and the bay sediments.
 - v. Is there historical data that can be relied upon to benchmark the variation to be expected at these sites and will these current data be of utility for statistical comparative analysis if a future assessment campaign is conducted,
 - vi. Were the locations selected in a way that captures urban drains or canals for flood waters draining from municipal and industrial facilities?
8. The study plan is limited to chemical contaminants; microbiological contaminants are not addressed. While conventional and toxic pollutants are the target of the water quality assessment, it seems somewhat short-sighted that microbiological water quality assessment is not being included in this study and that microbial pathogens are not being quantified. One might suggest that these are as large of a human health concern with respect to recreational use of these waters and fish and shellfish harvesting and consumption as are the chemical contaminants. Monitoring for fecal coliforms and enterococci is strongly recommended. The use of molecular probes should be considered for pathogens of concern. The study team may wish to consider freezing aliquots or samples for later microbiological

analysis as “insurance” should concerns for specific pathogens, such as hepatitis A, noroviruses, or the like arise. Recent data suggests enterococci are the best single indicator based on beach studies, etc.

9. Of the chemical contaminants that are included, it is not clear why they were selected for inclusion. Are there previous studies that show these to be chemicals of concern for this particular region. Why not include current use pesticides like the pyrethroids/pyrethrins, or the heavily used chlorpyrifos and important regional contaminants like mirex?
10. It is difficult to judge if the data are being gathered to assess potential human exposures, potential environmental exposures, or both; this should be explicitly stated. Analytical methods/detection limits appropriate for assessing human impacts may be substantially different than those for ecological effects assessment. The authors should review the method detection limits to ensure that the chosen analytical methods will provide detection limits sufficiently sensitive to assess potential risks (human and/or environmental). For example, a quick review of Table B2 indicates that the minimum quantitation limits for water (freshwater) and saline water are above the ambient water quality criteria for at least 5 metals, i.e., cadmium, chromium, copper, nickel, and silver. This will not provide data sufficient to assess potential risks to aquatic life.
11. Algal growth potential is to be measured, but what about aquatic toxicity tests? Why was the algal growth potential test selected as a bioassay when many other bioassays more intimately related to human health or health of commercially important species are available? What about ecosystem indicator species? Toxicity testing, such as the approach commonly used in the NPDES WET program (ceriodaphnia, fathead minnow) will provide useful information for assessing potential risks to aquatic organisms. Is sampling of benthic organisms possible or desirable at this stage?
12. Was any consideration given to measurement of radioactivity?
13. Should monitoring for total petroleum hydrocarbons be considered?
14. Was any consideration given to measurement of biological specimens such as shellfish as potential bioaccumulators of contaminants? It is believed that the NOAA ship *Nancy Foster* presently is/will be deploying off the Gulf Coast to run transects to look at water column and sediment impacts from toxics (particularly petroleum products, contaminated sediments). This effort is likely to be coordinated by the National Marine Fisheries Service and is believed to be related to damage assessments to shrimp habitat, oyster habitat, and other important fisheries in the near coastal environment. This may include Mississippi Sound. If it does, then perhaps there are opportunities to work jointly and share information.

15. In section 5.2, no mention is made of matrix spikes.
16. The summary of pollutant loadings in the final report (see Section 5.3, last sentence) should contain some indication of the uncertainty in the reported loadings.
17. What is the referenced analytical method for ALGP?
18. What is the analytical reference method for sediment dioxin analysis and why is an unidentified contract laboratory planning to do the work rather than an EPA laboratory? Should this not be justified or at least clarified?
19. Sample extraction/preparation methods should be reported. The methods in Appendix B are associated with the analysis. Extraction methods may be in the SOP documents cited but should at least be summarized in an appendix.

Minor comments:

The maps comprising Figures 1-5 are not very clear, especially for one who is not familiar with the details of the Mississippi coastline

Table 2. What is MS/MSD analysis in the footnote?

What does the last sentence in Section 4.2 mean?

Section 5.1 should make some mention of the findings at the MSDEQ stations and their relationship to the historical record.

In Section 5.2 item 2), line 5, there is a misprint. "...analyted-free" what?

In Table B2 and others, the water samples concentrations should be $\mu\text{g/L}$. The Greek "micro" may have been dropped in the file download.

Table 6 (Page 14). There are several misspellings (I think). The word "date" should be changed to "data". Global search for "date" where there should be "data".

Attachments (paper copies in FACA file)

1. Federal Register Notice
2. Agenda for the meeting
3. Workgroup roster and biosketches
4. Email approving minutes